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## DETAILED DESCRIPTION

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[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to a digital camera.

[0002]

[Description of the Prior Art] As for the digital camera of these days, it is common to have two or more photographing modes recorded with two or more compression ratios and recording sizes with one camera. As shown in drawing 19, 3 kinds of recording size D, E, and F can be chosen, and it can record by 3 kinds of recording size D of a dxd' pixel and an exe'pixel and fxf' pixel, E, and F, respectively. Each recording size D, E, and F are 1 MB, 0.5 MB, and 0.25 MB, for example. If the capacity of the recording memory of a camera shall be 10 MB, for example, number of sheets recordable with the taken image of recording size D, E, and F will be ten sheets, 20 sheets, and 40 sheets, respectively. Therefore, if a photography person chooses one from three kinds of recording sizes, the number of sheets which can be photoed automatically will become settled. About this number of sheets that can be photoed, it is displayed with the number-of-sheets display menu which can be photoed as shown, for example in drawing 20.

[0003]

[Problem(s) to be Solved by the Invention] However, there were the following problems in the conventional digital camera.

[0004] (1) In the digital camera in which recordable memory space was decided, even when the photography number of sheets which a photography person wishes beforehand is decided, the conventional camera can specify number of sheets and cannot photo it. Therefore, in order to photo the number of sheets to wish certainly, a photography person changes recording size, and it is necessary to take a photograph, caring about the recording size of a taken image, and the remaining capacity of a recording memory, and dramatically inconvenient.

[0005] (2) In the digital camera which can record a still picture, an animation, voice data, etc. by one set, if the continuous-shooting function of an animation or a still picture is used, unawares, a recording memory will fill and the problem that it cannot do even if it is going to photo a still picture if compelled will occur.

[0006] (3) Since the whole taken image cannot be seen in an instant unless it uses image-processing software for exclusive use etc. depending on recording size when a photography person looks at the picture photoed with the digital camera with displays, such as a CRT monitor, it is dramatically inconvenient to a photography person.

[0007](4) Even if the number of sheets which can be photoed serves as zero, there are many one more photography persons who want to surely take a photograph, and the actual condition is not being such a system. Then, the digital camera of this invention tends to provide the digital camera provided with the function of enabling it to photo certainly the photography number of sheets which a photography person wishes etc.

[0008]

[Means for Solving the Problem] This invention is characterized by the digital camera according to claim 1 comprising the following, in order to solve this technical problem.  
Image sensor.

A lens to which image formation of the object image is carried out on said image sensor.  
An image storing means which memorizes temporarily a photographing picture signal acquired from said image sensor.

An image compression means which compresses a picture signal read from said image storing means with two or more compression ratios, A memory means which writes in said picture signal with recording size according to a compression ratio of said compression means, A memory control means which controls reading from writing and said memory means to said memory means, A photography number-of-sheets setting means which specifies number of sheets of a taken image recorded on said memory means, and a control means as which recording size  $Z$  of a taken image determines a compression ratio of said image compression means so that it may become  $Z \leq (Y/X)$  when record possible capacity of said memory means is set to  $Y$  and said specified photography number of sheets is set to  $X$ .

[0009] In this composition, if photography number of sheets which a photography person wishes is specified beforehand, it will be compressed and recorded that recording size of a taken image becomes the optimal according to photography number of sheets. claim 2 written this invention is characterized by it having been alike and comprising the following.

Image sensor.

A lens to which image formation of the object image is carried out on said image sensor.  
An image storing means which memorizes temporarily a photographing picture signal acquired from said image sensor.

An image compression means which compresses a picture signal read from said image storing means with two or more compression ratios, A picture signal of the 1st photographing mode whose recording size a compression ratio of said taken image is  $a$ , and is  $A$ , And a memory means in which a compression ratio of said taken image is  $b$  (however,  $a < b$ ), and recording size can write a picture signal of the 2nd photographing mode that is  $B$  (however,  $A > B$ ), A memory control means which controls reading from writing and said memory means to said memory means, A photography number-of-sheets setting means which specifies number of sheets of a taken image recorded on said memory means, Record possible capacity of a counting means which counts said photography number of sheets, and said memory means  $Y$ , A control means controlled to change said specified photography number of sheets to photography by said 2nd photographing mode before it takes a photograph by the 1st photographing mode at first and remaining capacity  $Y$  [of said recording memory] [ $Y' = Y - AxN$ ] becomes  $Y' < Bx$  ( $X - N$ ), when  $X$  and said photography number-of-sheets count number are set to  $N$ .

[0010]In this composition, if photography number of sheets which a photography person wishes is specified beforehand, in capacity of a limited recording memory, as many photography as possible is performed in photographing mode with little image quality deterioration, it changes to photographing mode with a high compression ratio automatically after that, and number of sheets of choice can be photoed certainly.

[0011]claim 3 written this invention is characterized by it having been alike and comprising the following.

Image sensor.

A lens to which image formation of the object image is carried out on said image sensor.

A memory means which writes in a photographing picture signal acquired from said image sensor.

A switching means which changes the 1st and 2nd photographing mode that photos said taken image in the different mode, A setting means which specifies write-in capacity to said memory means in said 1st photographing mode, A counting means which counts the amount of writing to said memory means in said 2nd photographing mode, Write-in capacity [ in / for record possible capacity of said memory means / Y and said 1st photographing mode ] C, A control means controlled to end record by said 2nd photographing mode automatically before it takes a photograph by said 2nd photographing mode at first and the amount D of writing of said 2nd photographing mode serves as  $D > Y - C$ , when the amount of writing in said 2nd photographing mode is set to D.

[0012]In this composition, if a record section in photographing mode which a photography person expects of a recording memory is specified, even when a photograph will be taken by other photographing modes, other photographing modes are ended automatically and it will be in the state where a photograph can be taken in photographing mode to wish.

[0013]claim 4 written this invention is characterized by it having been alike and comprising the following.

Image sensor.

A lens to which image formation of the object image is carried out on said image sensor.

An image storing means which memorizes temporarily a photographing picture signal acquired from said image sensor.

An image compression means which compresses a picture signal read from said image storing means with two or more compression ratios, A memory means which writes in said taken image, and a memory control means which controls reading from writing and said memory means to said memory means, A display selecting means which chooses a display which displays a taken image, and a control means made to record with recording size doubled with a viewable size of a display with said selected display selecting means.

[0014]In this composition, if a display which a photography person wants to display is chosen, it will be recorded with recording size doubled with a viewable size of this display. A lens to which the digital camera according to claim 5 carries out image formation of the object image on an image sensor and said image sensor, A memory means which consists of two or more fields which write in a photographing picture signal

acquired from said image sensor, A memory control means which controls reading from writing and said memory means to said memory means, It has a displaying means which displays recordable number of sheets of said taken image in a specific field of said memory means, When recordable number of sheets in a specific field of said memory means was set to X, in all the fields of said memory means, it constituted so that a taken image of \*\* could be written in at least (X+1).

[0015]According to this composition, even if a numerical value displayed on a display menu which can be photoed serves as zero, it becomes possible to photo a picture of at least one sheet.

[0016]

[Embodiment of the Invention]Hereafter, an embodiment of the invention is described based on a drawing. First, the digital camera concerning a 1st embodiment of this invention is explained using drawing 1 - drawing 5. The appearance perspective view of a digital camera [ in / in drawing 1 / a 1st embodiment ], the block diagram in which drawing 2 shows the composition of the hardware of the digital camera, The figure in which drawing 3 shows a photography number-of-sheets set menu, the figure in which drawing 4 (a) - (c) shows the recording size of a taken image roughly, and drawing 5 are the flow charts about the photography number-of-sheets setting-out mode of the digital camera.

[0017]CCD(solid state image pickup device) 4 is provided in the image formation position of the lens 3 held at the lens barrel 2 of the digital camera 1. CCD4 is an image sensor which changes into an electrical signal the image which enters via the lens 3, and the operation is controlled by the CCD drive control means 5. The analog-signal-processing means 6 is connected to CCD4, and this analog-signal-processing means 6 performs analog signal processing, such as gamma processing, to the video signal obtained by CCD4. The A/D conversion means 7 is connected to the analog-signal-processing means 6, and this A/D conversion means 7 changes into a digital signal the video signal of the analog outputted from the analog-signal-processing means 6. The digital signal processing means 8 is connected to the A/D conversion means 7, and this digital signal processing means 8 performs digital signal processing, such as noise rejection and edge enhancement, to the video signal changed into the digital signal by the A/D conversion means 7.

[0018]It adds to this digital camera 1 at the above-mentioned component, As the image memory 9 as an image storing means, the image memory drive control means 10, the image compression means 11, and a memory means. As \*\*\*\*\* 12, the recording memory drive control means 13 as a memory control means, and a control means. The \*\* microcomputer 14, the electric power switch 15, the zoom-magnifying-power change lever 16, the shutter release 17, the photography number-of-sheets selecting means 18 as a photography number-of-sheets setting means, the photography number-of-sheets displaying means 20, etc. are established.

[0019]The image memory 9 once memorizes the picture signal which passed through the digital signal processing means 8, and comprises RAM etc., for example. The image memory drive control means 10 controls the writing of a picture signal to the image memory 9, and read-out. The once memorized picture signal is read to the image memory 9 one by one, and is inputted into it to the image compression means 11. The picture signal inputted into this image compression means 11 receives the compression like data

by a predetermined ratio here, and serves as recording size smaller than the original data. As a compression algorithm in this image compression means 11, the JPEG (Joint Photographic Experts Group) method is adopted, for example. The picture processed by this image compression means 11 is sent to the recording memory 12.

[0020]If recording size of an original image is set to A (axa' pixel) as shown in drawing 4 (a) - (c) for example, the recording size of a taken image, As shown in recording size B (bxb' pixel) and recording size C (cxc' pixel), compression of a picture is enabled with two or more kinds of compression ratios, and the compression ratio of recording size A is the smallest. Therefore, recording size serves as  $A > B > C$  and there is least degradation whose thing of recording size A is a taken image. The recording memory drive control means 13 controls the writing of a picture signal to the recording memory 12, and read-out.

[0021]The image memory drive control means 10 and the recording memory drive control means 13 are managed unitary with the microcomputer 14 as a control means. The microcomputer 14 performs zoom-magnifying-power control of the lens barrel 2, automatic exposure control, autofocus control, etc. based on the signal from the electric power switch 15, the zoom-magnifying-power change lever 16, and the shutter release 17.

[0022]The number of sheets which a photography person wants to photo by operating the photography number-of-sheets selecting means 18 according to the photography number-of-sheets selection menu 19 shown in drawing 3 can be chosen now. Photography number of sheets recordable on the recording memory 12 is displayed on the photography number-of-sheets displaying means 20. In this embodiment, although the photography number-of-sheets selecting means 18 comprises the increase button 18a in photography number of sheets, and the photography number-of-sheets reduction button 18b, it does not restrict to this composition.

[0023]The control action of the microcomputer 14 in the digital camera 1 constituted in this way is explained based on the flow chart shown in drawing 5. the power supply of the digital camera 1 -- the electric power switch 15 -- one (F501) -- the recording memory drive control means 13 computes the record possible capacity (Y) of the recording memory 12 (F502). photography number-of-sheets (X) which a photography person operates the photographing-settings number-of-sheets set menu 19 in this state (F503), and is needed -- beforehand -- setting up (F504) -- the microcomputer 14, The recording size ( $Z=Y/X$ ) per [ which becomes settled when photography number of sheets is set to (X) ] taken image is computed (F505). In this case, in order to photo the X microcomputers 14. Since the recording size per taken image computed that below Z had to carry out, it becomes what (F506) one kind of recording size is chosen from among 3 kinds of recording size A carried in the digital camera 1, B, and C for. That is, in  $Z \geq A$ , B, and C, recording size A is chosen, when it is  $Z \geq B$  and C, recording size B is chosen, and when it is  $Z \geq C$ , recording size C is chosen. Since the number of sheets which a photography person wishes cannot be photoed at this time in  $Z < A$ , B, and C, a photography (not shown) person is told by carrying out a warning display to an indicator about reducing photography number of sheets. At this embodiment, setting out of photography number of sheets is ended by choosing recording size B (F507).

[0024]Thereby, according to the number of sheets which a photography person wishes, the recording size in the case of taking a photograph using the digital camera 1 can be set

up easily. If a photography person takes a photograph by pushing the shutter release 17, the display of the number-of-sheets displaying means 20 which can be photoed can be photoed until it decreases at a time to one sheet and becomes zero from the setting-out number of sheets X.

[0025]By setting up beforehand the photography number of sheets which a photography person wishes, and optimizing the recording size of a taken image according to photography number of sheets according to this embodiment, as mentioned above, Since the number of sheets of choice can be certainly photoed not related to the record possible capacity of the recording memory 12, it becomes a system useful for a photography person.

[0026]In this embodiment, although only the mode in which photography number of sheets was set up beforehand was explained, even if it is concomitant use with the method of setting up first the recording size used conventionally, it cannot be overemphasized that the same effect is acquired.

[0027>About the recording memory 12, like archive media, such as not only the thing of built-in in the digital camera 1 but an SD card, even if it inserts and uses for the digital camera 1 from the outside, the same effect is acquired. Only the number of sheets of choice can be photoed certainly, without eliminating the data, also when the data recorded before is left behind.

[0028]It is not limited for a compression method to a JPEG system. It may be the method of making small pixel size to record and making recording size small about compression of recording size.

[0029]It may be not only a still picture but an animation, or music data which is recorded on the recording memory 12, and it should just make the record time specification called the photography number of sheets in the case of a still picture. What is necessary is to classify into several kinds according to a compression ratio, and just to constitute with it about recording size, like a still picture.

[0030]It may be a method which records different data of a still picture, music data, etc. on the still more nearly same recording memory 12. Next, the digital camera concerning a 2nd embodiment of this invention is explained using drawing 6 - drawing 8. The block diagram showing the composition of the hardware of a digital camera [ in / in drawing 6 / a 2nd embodiment ], the figure with which drawing 7 explains the items of the record section of the recording memory in the digital camera, and drawing 8 are the flow charts about the photography number-of-sheets setting-out mode of the digital camera. About what was explained until now, the same numerals are attached and the explanation is omitted.

[0031]As shown in drawing 6, in addition to the component of drawing 2 explained by a 1st embodiment, in hardware constitutions, the recording-mode displaying means 21 is added to this digital camera 1. The recording size of the taken image of the digital camera 1 is provided with the following.

The thing of recording size A (compression ratio a) shown in drawing 4 (a).

The 1st photographing mode that the thing of recording size B (it is  $b > a$  at the compression ratio b) shown in drawing 4 (b) is provided, and is photoed in recording size A.

The 2nd photographing mode photoed in recording size B.

The A of recording size is larger and there is little image quality deterioration at the time

of record. It indicates any of the 1st photographing mode and the 2nd photographing mode it is using for the photographing mode displaying means 21 now, and a photography person is made to recognize it. A taken image is recorded on the recording memory 12 by assignment as shown in drawing 7. The photography number of sheets which a photography person with the selected photography number-of-sheets selecting means 18 wishes is set to X, and when the number of sheets photoed by the 1st photographing mode is set to N, the number of sheets photoed by the 2nd photographing mode serves as (X-N). Therefore, the recording size of the picture recorded in the 1st photographing mode is  $A \times N$ , and the recording size of the picture recorded in the 2nd photographing mode becomes  $B \times (X-N)$ .

[0032]The control action of the microcomputer 14 in the digital camera 1 constituted in this way is explained based on the flow chart shown in drawing 8. the power supply of the digital camera 1 -- the electric power switch 15 -- one (F801) -- the recording memory drive control means 13 computes the record possible capacity (Y) of the recording memory 12 (F802). photography number-of-sheets (X) which a photography person operates the photographing-settings number-of-sheets set menu 19 in this state (F803), and is needed -- beforehand -- setting up (F804) -- photography is performed among the beginnings by the 1st photographing mode whose recording size is A (F805). Since there is less image quality deterioration than the picture recorded by the 2nd photographing mode, the picture recorded by the 1st photographing mode can be photoed finely.

[0033]When photography is performed, this photography number of sheets N counts (F806), and remaining capacity Y[ of the recording memory 12 ] [ $Y' = Y - A \times (N+1)$ ] is calculated with the microcomputer 14 (F807). Here, when continuing photography by the 1st photographing mode, if the photography number of sheets X which the photography person set up beforehand cannot be photoed, inconvenience arises. Therefore, it may have to face photoing the set-up number of sheets X, may have to change to the 2nd photographing mode used as photography by recording size B smaller than recording size A, and photography may have to be continued. Therefore, it is judged whether the microcomputer 14 can photo the remaining number of sheets (X-N) in the time of photography of N sheets being completed by the photographing mode 2 here (F808). Namely, remaining capacity Y' of the recording memory 12 distinguishes whether it is smaller than  $B \times (X-N)$ , and in  $Y' \geq B \times (X-N)$ , Photography by the 1st photographing mode is continued, and conversely, in  $Y' < B \times (X-N)$ , the recording size of a picture changes to the 2nd photographing mode that is B automatically, and continues photography (F809).

[0034]Here, the above-mentioned process (F808) of a flow chart and (F809) are explained using a concrete numerical value. When it is considered as the 20 photography number of sheets X which 1 MB wishes in recording size A, and 18 MB of record possible capacity Y of 0.5 MB and the recording memory 12 wishes in recording size B, the following control actions are performed. Since it is  $Y' = 18 - 1 \times (14+1) = 3\text{MB}$  and  $B \times (X-N) = 0.5 \times (20-14) = 3\text{MB}$  when the already photoed number of sheets is  $N = 14$ , it becomes  $Y' = B \times (X-N)$  and judges that one more sheet can be photoed by the 1st photographing mode 1. Next, since it is  $Y' = 18 - 1 \times (15+1) = 2\text{MB}$  and is  $B \times (X-N) = 0.5 \times (20-15) = 2.5\text{MB}$  at the time of  $N = 15$ , it becomes  $Y' < B \times (X-N)$  and judges that the following one sheet cannot be photoed in the 1st photographing mode. Therefore, the photography from the 16th sheet is changed to the 2nd photographing mode. Therefore,

the size of the taken image recorded on the recording memory 12 by photoing 15 sheets in the 1st photographing mode, and photoing the five remaining sheets by the 2nd photographing mode, the beginning is [ in / it is set to  $1 \times 15 + 0.5 \times 5 = 17.5 \text{MB}$ , and / 18 MB of recording memory 12 ] as desired -- photography of 20 sheets is attained. As for recording size B, since the compression ratio is higher than recording size A, image quality deteriorates. If a photography person takes a photograph by pushing the shutter release 17, the display of the number-of-sheets displaying means 20 which can be photoed can be photoed until it decreases at a time to one sheet and becomes zero from the setting-out number of sheets X.

[0035]As mentioned above, according to this embodiment, set up beforehand the photography number of sheets which a photography person wishes, and in the capacity of the limited recording memory 12, It becomes an effective system which is useful and can suppress image quality deterioration for a photography person in photographing mode with little image quality deterioration to the minimum since many can be photoed as much as possible. The photographing mode can photo the number of sheets of choice certainly, without troubling a photography person's time and effort, since it changes automatically.

[0036]Like a 1st embodiment, it may be not only a still picture but an animation, or the voice data which is recorded on a recording memory, and it should just make the record time specification called the photography number of sheets in the case of a still picture.

[0037]The digital camera concerning a 3rd embodiment of this invention is explained using drawing 9 - drawing 11. The block diagram showing the composition of the hardware of a digital camera [ in / in drawing 9 / a 3rd embodiment ], the figure with which drawing 10 explains the items of the record section of the recording memory in that of the digital camera, and drawing 11 are the flow charts about photographing mode setting out of the digital camera. About what was explained until now, the same numerals are attached and the explanation is omitted.

[0038]As shown in drawing 9, in addition to the component of drawing 6 explained by a 2nd embodiment, in hardware constitutions, the shutter / recording button 22, and the number of sheets/time display means 23 that can be photoed are added to this digital camera 1. This digital camera 1 is provided with the following.

The 1st photographing mode that photos a still picture.

The 2nd photographing mode that photos an animation.

Therefore, it indicates any of the 1st photographing mode and the 2nd photographing mode it is using for the photographing mode displaying means 21 now, and it makes a photography person recognize. A taken image is recorded on the recording memory 12 by assignment as shown in drawing 10. When it sets up set to X the number of sheets which a photography person wants to photograph by the photography number-of-sheets selecting means 18 with the still picture which is the 1st photographing mode, the record section of the picture recorded in the 1st photographing mode is set to C, and the record section of the picture recorded in the 2nd photographing mode serves as (Y-C).

[0039]The control action of the microcomputer 14 in the digital camera 1 constituted in this way is explained based on the flow chart shown in drawing 11. the power supply of the digital camera 1 -- the electric power switch 15 -- one (F1101) -- the recording memory drive control means 13 computes the record possible capacity (Y) of the recording memory 12 (F1102).



[0040]For example, since it is not necessary to care about the remaining capacity of the recording memory 12 even if it records other photographing modes, for example, an animation, on the recording memory 12 by securing beforehand the field where a photography person wants to photograph a still picture, In this state, a photography person operates the photography number-of-sheets set menu 19 of the photographing mode 1 which photos a still picture (F1103), and considers the case (F1104) where photography number-of-sheets (X) to need is set up beforehand.

[0041]In this case, the microcomputer 14 sets recording size per sheet to A, and converts it into recording size C ( $C=A \times X$ ) (F1105), and the still picture storage capacity C is secured to the recording memory 12 (F1106). That is, since inconvenience will arise if the still picture storage capacity which the photography person chose the 2nd photographing mode that is animation photographing mode, continued photography (F1107, F1108, F1109), and set up beforehand decreases after this, Before the field which records an animation crosses the field set up beforehand, it is necessary to make animation photography stop. therefore -- before stopping animation photography -- anyway -- or -- if it will end soon is displayed from before. Therefore, while recording operation is continuing, the recording animation size D recorded on the recording memory 12 is calculated (F1110), When the recording animation size D is smaller than the recording animation field (Y-C) secured to the recording memory 12, photography of an animation -- continuing (F1111) -- when it is likely to become larger than a recording animation field (Y-C) conversely, before becoming such a situation, the 2nd photographing mode (animation photographing mode) is stopped (F1112). And when the 2nd photographing mode is completed, it switches to the 1st photographing mode (still picture photographing mode) automatically (F1113).

[0042]Since the field of the number of sheets of the static image photographing which a photography person expects of the recording memory 12 is securable as mentioned above according to this embodiment, Since animation photographing mode can be automatically terminated even when other photographing modes, for example, animation photography, are being performed, the worst situation where a still picture cannot be photoed can be avoided and it becomes an effective system for a photography person.

[0043]In this embodiment, although animation photographing mode was explained about the 2nd photographing mode, even if it does not limit to this and is a continuous shooting mode of a still picture, and record of voice data, for example, it cannot be overemphasized that the same effect is acquired.

[0044]Although one kind of still picture photographing mode was explained about the 1st photographing mode, it may be a method which is chosen from several photographing modes from which a compression ratio differs. It may be record of the animation of not only static image photographing but others, and voice data.

[0045]The digital camera concerning a 4th embodiment of this invention is explained using drawing 12 - drawing 16. The block diagram showing the composition of the hardware of a digital camera [ in / in drawing 12 / a 4th embodiment ], The figure in which drawing 13 shows the display size set menu of the taken image of the digital camera, The figure in which drawing 14 shows the relation between the display size of the digital camera and the recording size of a taken image, the figure with which drawing 15 explained the display of the taken image to the display of the digital camera, and drawing 16 are the flow charts about display size setting out of the digital camera. About

what was explained until now, the same numerals are attached and the explanation is omitted.

[0046]As shown in drawing 12, in addition to the component of drawing 6 explained by a 2nd embodiment, in hardware constitutions, the display size selecting means 24 and the display size displaying means 26 which function as display selecting means are added to this digital camera 1. The recording size of the taken image of this digital camera 1, As shown in drawing 14, are three kinds, and a taken image is compressed using the image compression means 30, For example, it is recorded on the recording memory 12 with recording size (pixel size) like recording size A (1600x1200 pixels), recording size B (1024x768 pixels), and recording size C (800x600 pixels). The display size selecting means 24 chooses the size of the display 30 on which you want to display the picture which the photography person photoed, for example, a CRT monitor, according to the display size selection menu 25 shown in drawing 13. The relation between a monitor and recording size is as being shown in drawing 14. For example, the picture of recording size A (1600x1200 pixels) can be displayed on a 21-inch monitor, The picture of recording size B (1024x768 pixels) can be displayed on a 17-inch monitor, and the picture of recording size C (800x600 pixels) can be displayed on a 15-inch monitor. That is, if 21 inches is chosen with the display size selection menu 25, recording size A and 17 inches will be chosen and recording size B and 15 inches will be chosen, a taken image will be recorded on the recording memory 12 in recording size C.

[0047]The control action of the microcomputer 14 in the digital camera 1 constituted in this way is explained based on the flow chart shown in drawing 16. one [ the power supply of the digital camera 1 / with the electric power switch 15 ] -- carrying out (F1601) -- the viewable-size set menu 25 of a taken image -- choosing (F1602) -- the size of the display 30 is displayed with the set menu 25 (F1603). this time -- 17 inches -- choosing (F1604) -- the image recording size recorded on the recording memory 12 is changed into recording size B which is 1024x768 pixels (F1605). If it records at 1600x1200 pixels which is recording size A, for example when the display 30 is a 17-inch monitor as shown in drawing 15 (a), when displaying the picture, the all cannot be expressed as a 17-inch monitor. Therefore, in order for a photography person to look at all the pictures, it is necessary to scroll a picture or to reduce using image-processing software for exclusive use. However, when it turns out beforehand that the monitor which a photography person uses is 17 inches. By choosing recording size B (1024x768 pixels) at the time of photography, all the taken images can be displayed in an instant, without also carrying out processing of what, as shown in drawing 15 (b). Thus, setting-out mode is ended (F1606).

[0048]According to this embodiment, according to the size of the display 30 which a photography person wants to display, by setting up the recording size of a taken image as mentioned above, Since the time and effort using image-processing software for exclusive use etc. is lost when displaying on the display 30, it becomes a system useful for a photography person that all the pictures can be seen in an instant etc.

[0049]It is not limited for the display 30 and the size of recording size, and a kind to what was described by this embodiment. The digital camera concerning a 5th embodiment of this invention is explained using drawing 17 and drawing 18. The block diagram and drawing 18 in which the composition of the hardware of a digital camera [ in / in drawing 17 / a 5th embodiment ] is shown are a figure explaining the items of the record section

of the recording memory in the digital camera. About what was explained until now, the same numerals are attached and the explanation is omitted.

[0050]A taken image is recorded on the recording memory 12 of this digital camera 1 by assignment as shown in drawing 18. Usually, X taken images at the time of photography are recorded on the 1st record section 12a for still pictures. The 2nd record section 12b is formed in addition to 1st record section 12a, and the field which the still picture of at least one sheet can record is secured in this 2nd record section 12b. The number-of-sheets displaying means 20 which can be photoed displays the number of sheets which can be photoed only based on the picture recorded on the 1st record section 12a.

[0051]Operation of the digital camera 1 constituted in this way is explained. If a photography person takes a photograph by pushing the shutter release 17, the display of the number-of-sheets displaying means 20 which can be photoed can be photoed until it decreases at a time to one sheet and becomes zero from the number of sheets X which can be photoed. Usually, although photography becomes impossible at this time, since the 2nd record section 12b is beforehand secured to the recording memory 12, even if the number of sheets which can be photoed serves as zero, the picture of at least one sheet can be photoed and a taken image can be recorded on the 2nd record section 12b.

[0052]Since the 2nd record section 12b that is a record section for urgent was secured to the recording memory 12 as mentioned above according to this embodiment, Since it becomes possible to photo the picture of at least one sheet even if the numerical value displayed on the display menu which can be photoed serves as zero, it can respond to the emergency of liking to photo only one more sheet etc., and becomes an effective system for a photography person.

[0053]About the recording memory 12, also when a hard disk etc. are used, the same effect is acquired. Although the embodiment of the invention explained the case where the field which continued within the recording memory 12 was secured about the 2nd record section 12b that records on an emergency, Although the data which is recorded first in the case of a hard disk is recorded on a continuous field, if record data increases in number and it becomes impossible to record on a continuous field, data will be fragmented and it will be recorded on a different track etc. Therefore, at the time of photography, a taken image is recorded on the continuous field and the effect same also as a system which fragments and records a taken image on a field which divides and is different is usually acquired at the time of urgent photography.

[0054]

[Effect of the Invention]As mentioned above, by according to the digital camera according to claim 1, setting up beforehand the photography number of sheets which a photography person wishes, and optimizing the recording size of a taken image according to photography number of sheets, The prominent effect that the number of sheets of choice can be certainly photoed not related to the record possible capacity of a recording memory is acquired.

[0055]According to the digital camera according to claim 2, the photography number of sheets which a photography person wishes can be set up beforehand, and as many photography as possible can be carried out in photographing mode with little image quality deterioration in the capacity of the limited recording memory. The prominent effect that the number of sheets of choice can be photoed certainly is acquired without troubling a photography person's time and effort, since it changes to photographing mode

with a high compression ratio automatically even if it becomes impossible to photo the number of sheets of choice in photographing mode with little image quality deterioration. [0056] Since the record section in the photographing mode which a photography person expects of a recording memory is securable according to the digital camera according to claim 3, Since other photographing modes can be automatically terminated even when a photograph is being taken by other photographing modes, the prominent effect that the worst situation where a photograph cannot be taken in the photographing mode to wish is avoidable is acquired.

[0057] Since the recording size of a taken image is set up according to the size of the display which a photography person wants to display according to the digital camera according to claim 4, When displaying on a display, the time and effort of reducing a picture is lost using image-processing software for exclusive use etc., and the prominent effect that all the pictures can be seen in an instant is acquired.

[0058] Since the record section for urgent was secured to the recording memory according to the digital camera according to claim 5, Since it becomes possible to photo the picture of at least one sheet even if the numerical value displayed on the display menu which can be photoed serves as zero, the prominent effect that it can respond to the emergency that a photography person wants to photo only one more sheet etc. is acquired.

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[Translation done.]